

FQ5-607

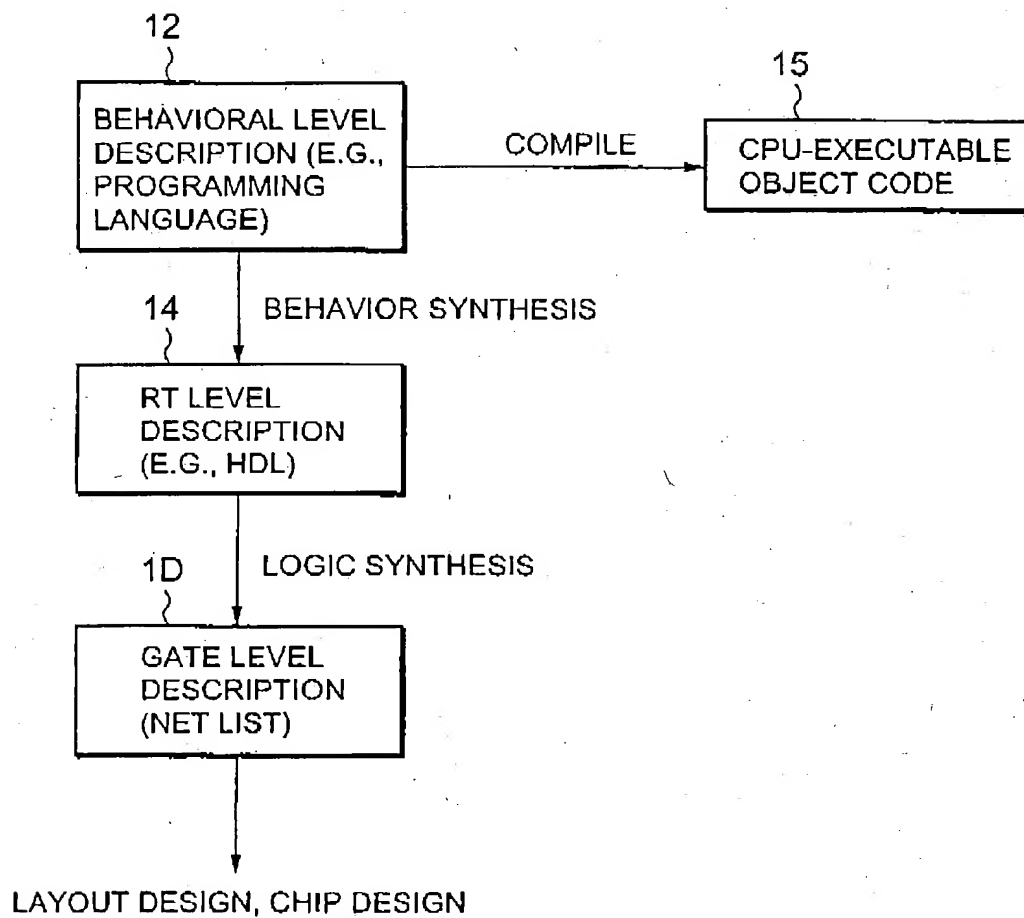
LOGIC CONE EXTRACTION
TECHNIQUE

Inventor(s): Takashi TAKENAKA

Atty. Docket No. 043034-0180

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FIG.1 (PRIOR ART)

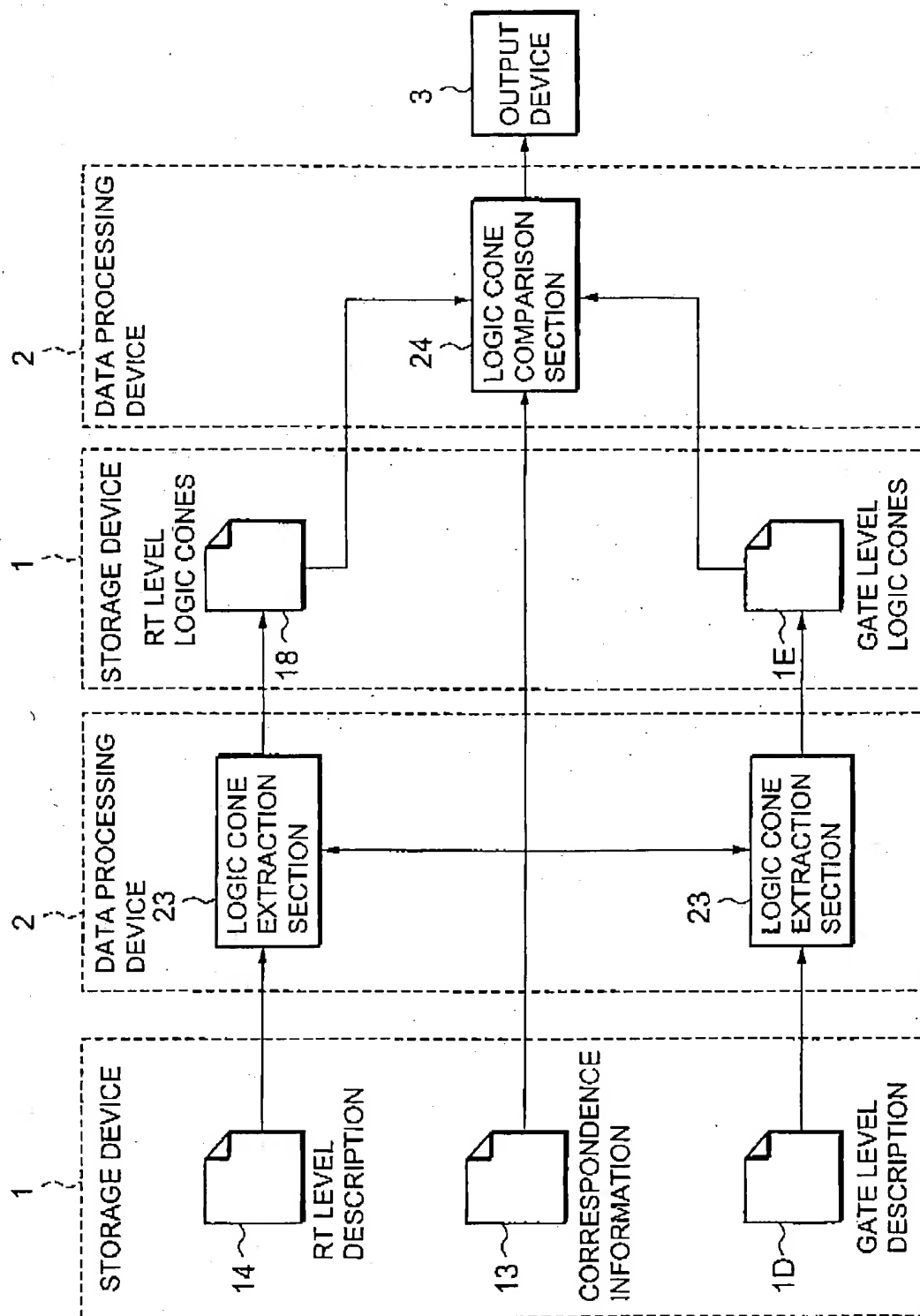


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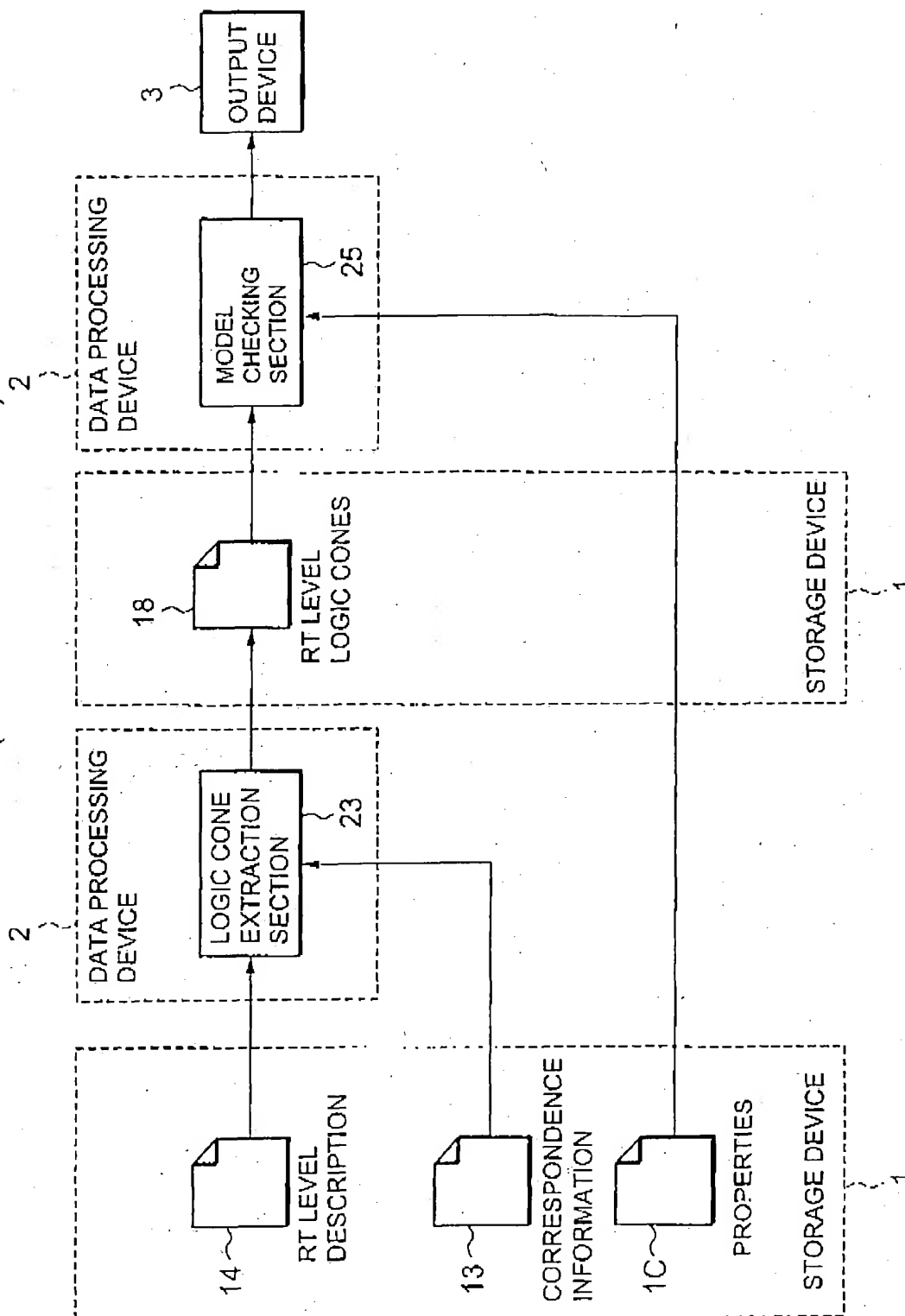
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FIG. 2 (PRIOR ART)



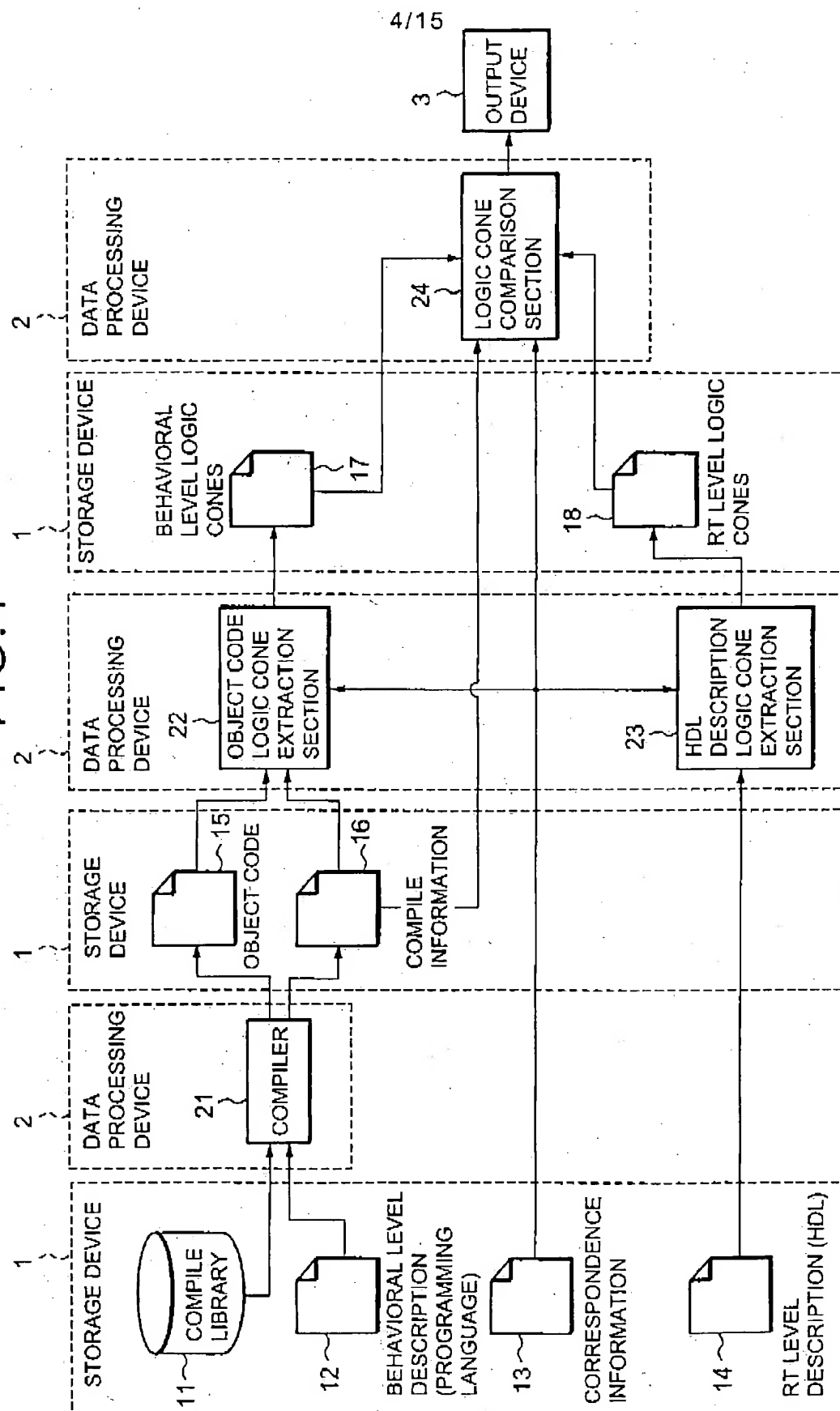
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FIG. 3 (PRIOR ART)



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FIG.4



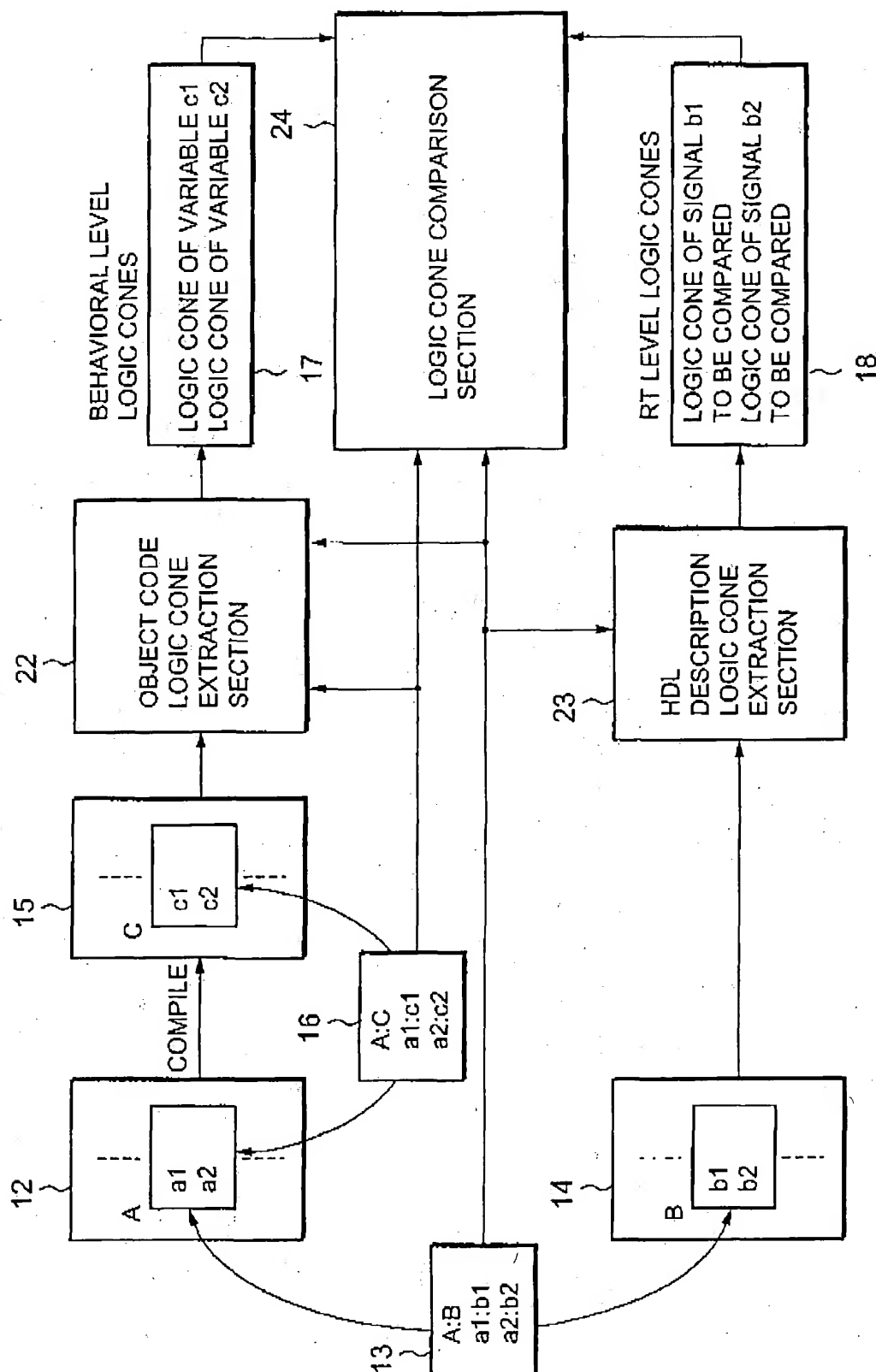
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FIG. 5



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FIG. 6

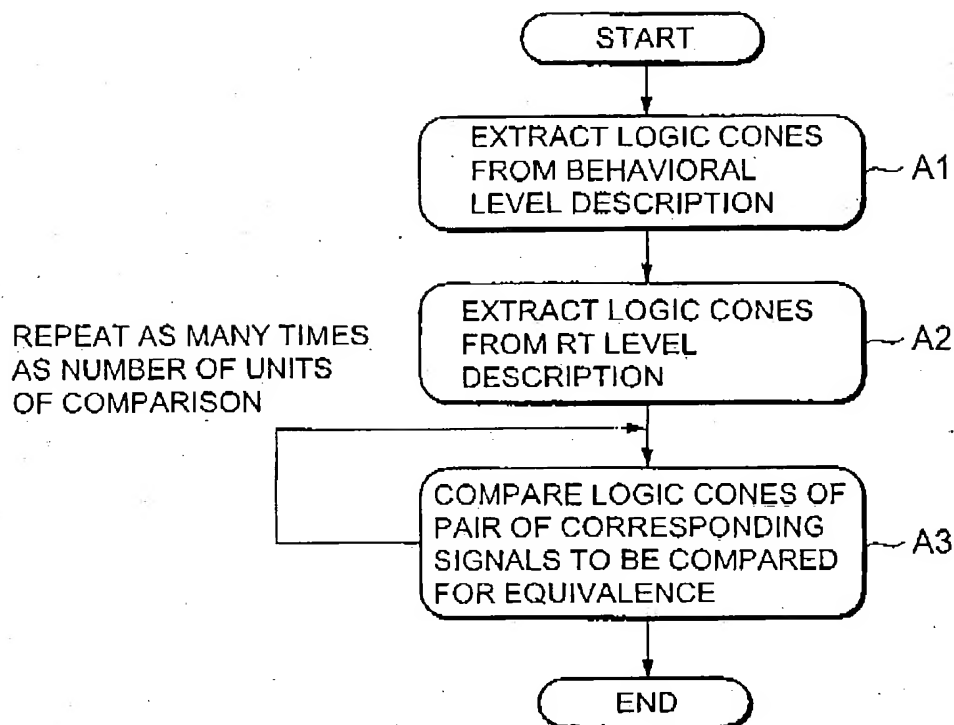
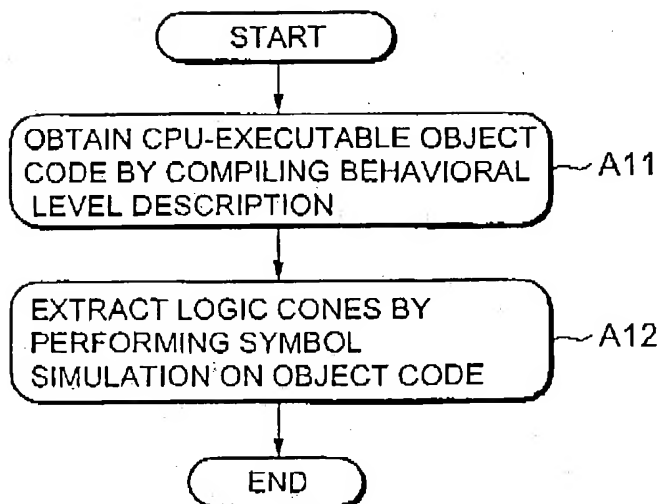


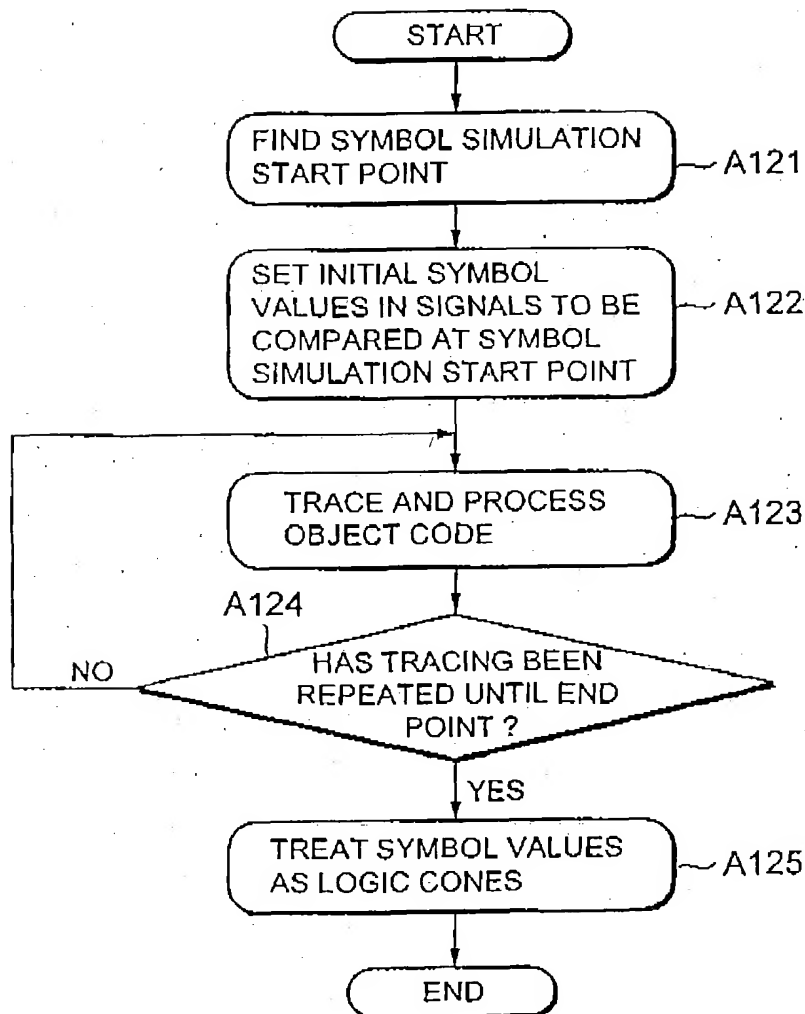
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FIG.8



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FIG. 9

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```

int a, b, c ; .....(1)
int in0, out0 ; .....(2)
#ifdef c .....(3)
main ( ) { .....(4)
    while (1) { .....(5)
        scanf ("%d", &in0) ; .....(6)
        addition ( ) ; .....(7)
        printf ("%d\n", out0) ; .....(8)
    } .....(9)
} .....(10)
#endif .....(10)

/* to behavioral Synthesis */ .....(11)
void addition ( ) .....(12)
{ .....(13)
    b = a + b ; .....(14)
    a = in0 ; .....(15)
    out0 = b ; .....(16)
    return ; .....(17)
} .....(18)

```

FIG. 10

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```

module addition (in0, out0, CLOCK) ; .....(1)
input [31:0] in0 ; .....(2)
output [31:0] out0 ; .....(3)
input CLOCK .....(4)
reg [31:0] RG01 ; .....(5)
reg [31:0] RG02 ; .....(6)

assign out0 = RG02 ; .....(7)

always @ ( posedge CLOCK) .....(8)
begin .....(9)
    RG01 <= in0 ; .....(10)
    RG02 <= RG01 + RG02 ; .....(11)
end .....(12)
endmodule .....(13)

```

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FIG. 11

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```

addition : .....(1)
    movl a, %eax .....(2)
    addl %eax, b .....(3)
    movl in0, %eax .....(4)
    movl %eax, a .....(5)
    movl b, %eax .....(6)
    movl %eax, out0 .....(7)
  
```

FIG. 12

EXAMPLE OF CORRESPONDENCE INFORMATION (PARTIAL)

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SIGNALS IN C DESCRIPTION	SIGNALS IN HDL DESCRIPTION
in0	in0
out0	out0
a	RG01
b	RG02

FIG. 13

EXAMPLE OF COMPILE INFORMATION (PARTIAL)

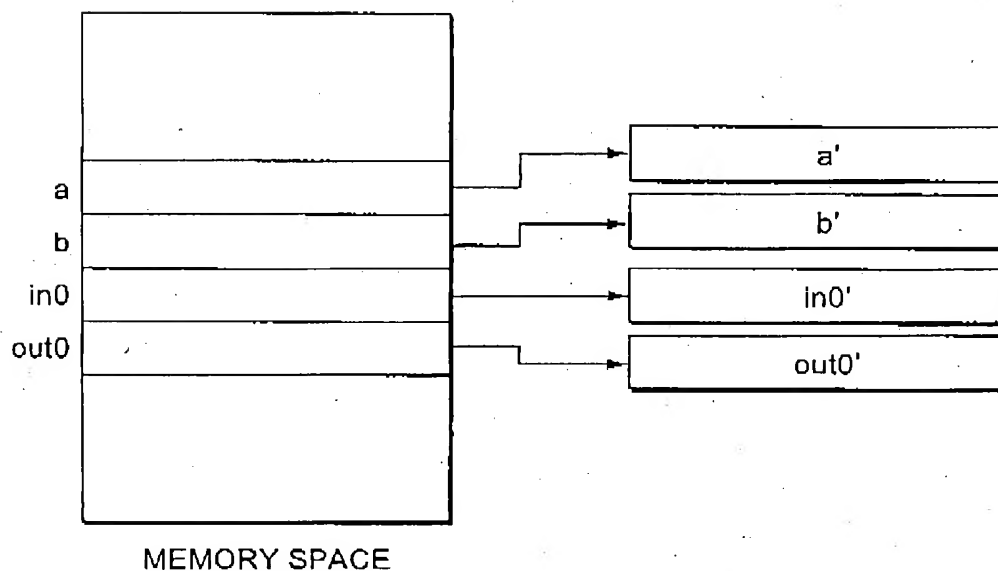
SIGNALS IN C-LANGUAGE DESCRIPTION	STORAGE AREA IN OBJECT CODE
in0	in0
out0	out0
a	a
b	b

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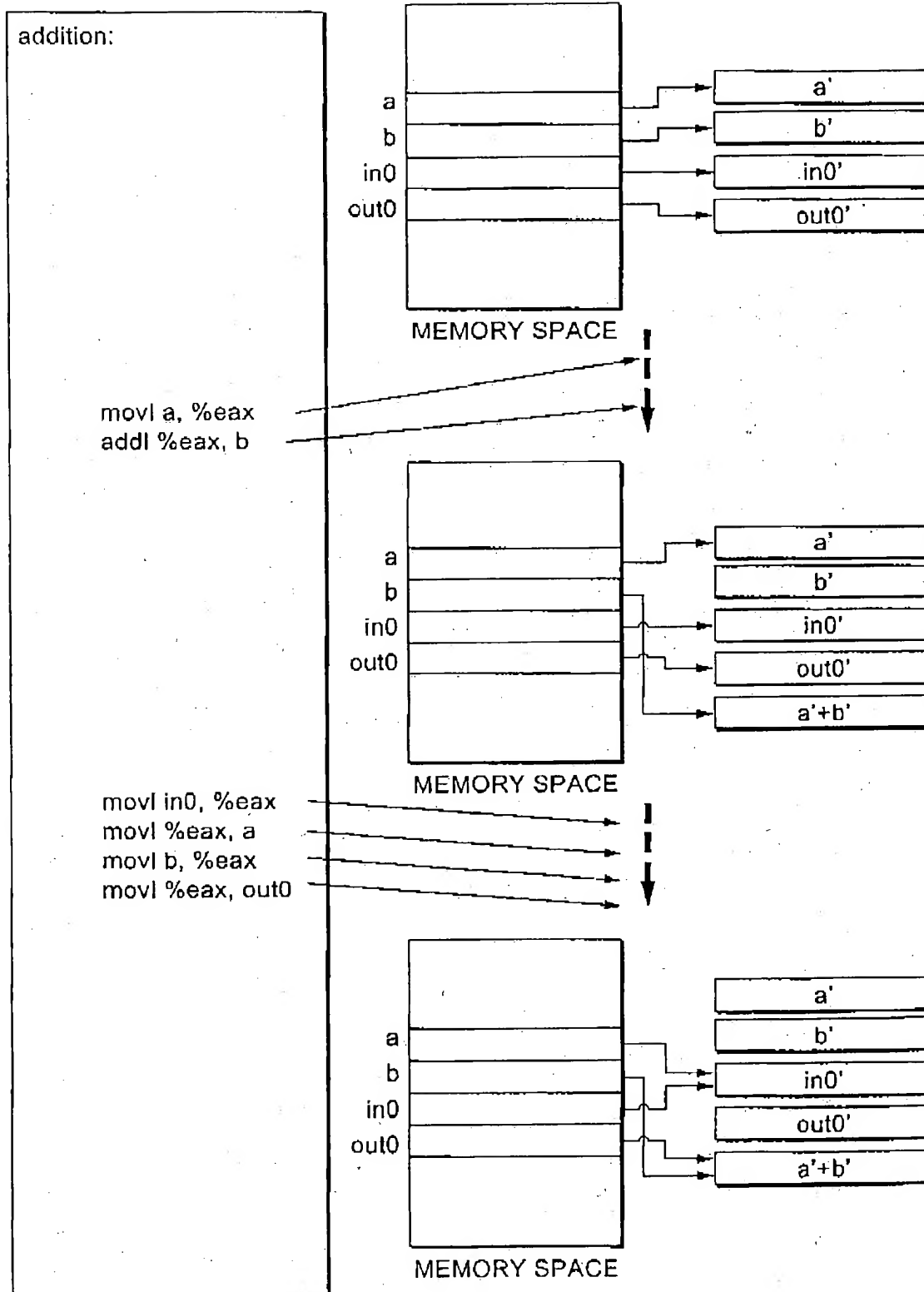
FIG.14



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FIG.15



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FIG.16

EXAMPLES OF LOGIC CONES IN PROGRAM DESCRIPTION

VARIABLE	LOGIC CONE
a	in0'
b	a'+b'
in0	in0'
out0	a'+b'

FIG.17

EXAMPLES OF LOGIC CONES IN HDL DESCRIPTION

VARIABLE	LOGIC CONE
RG01	in0'
RG02	RG01'+RG02'
in0	in0'
out0	RG01'+RG02'

FIG.18

CORRESPONDENCE BETWEEN VARIABLES
IN OBJECT CODE AND SIGNALS IN HDL

VARIABLE IN OBJECT CODE	SIGNAL IN HDL
a	RG01
b	RG02
in0	in0
out0	out0

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FIG.19

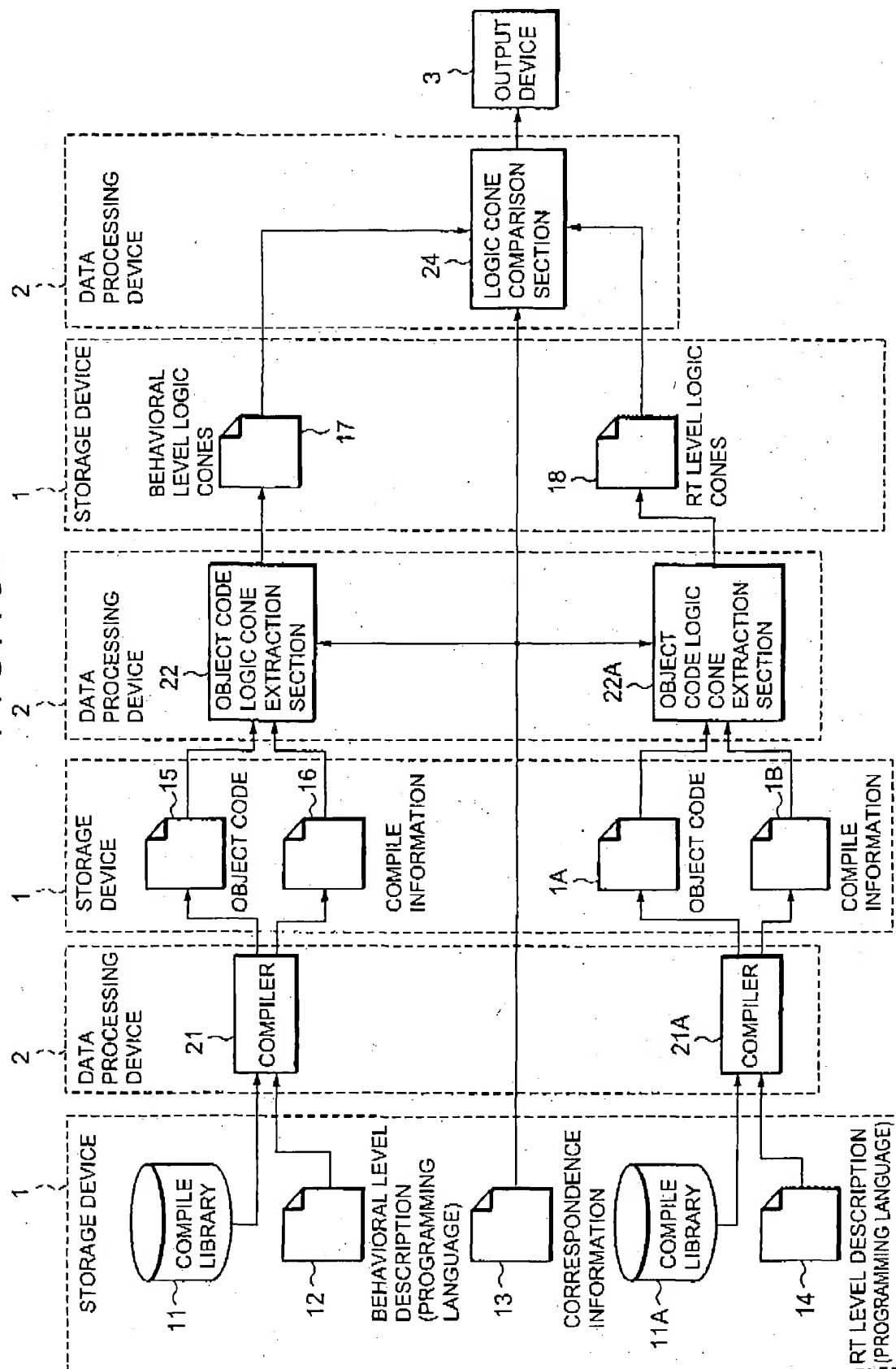
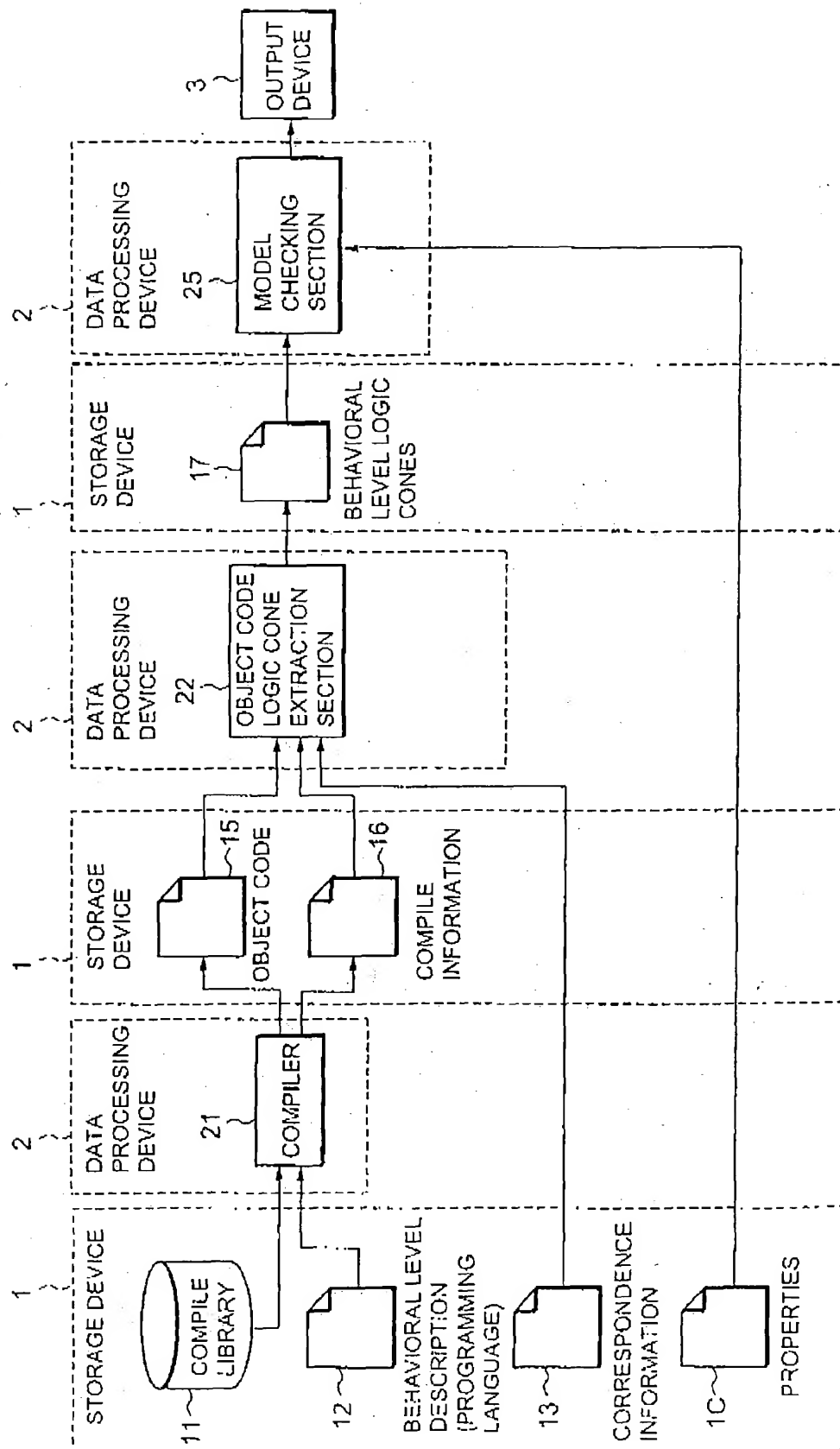


FIG. 20



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FIG. 21

